PHASE AND SEQUENCE DIAGRAM

		Traffic Signal Head 1	2,3	4,5	4,7,8,9	Min Green	Passage	Yellow	Red Clear	Max I	Seconds Per Actuation	Time to Reduce	Time Before Reduction	Minimum Gap	Recall	Memory
	Phase A	G	G	R	R	12	1			17					Off	Off
	Phase A Clear	Y,R	G	G	R			4	1							
	Phase B	R	G	G	R	13	5			13	3	5	5	3.5	Off	On
	Phase B Clear	R	Y,R	Y,R	R			4	1							
	Phase C	R	R	R	G	14	5			25	1.5	10	10	3.5	Off	On
	Phase C Clear	R	R	R	Y,R			4	1							
	Flash	R	R	R	Y											

GENERAL NOTES

1. All highway marking shall be the responsibility of the Division of Traffic Engineering of the Bureau of Engineering, Department of Public Works, of Howard County, Maryland, and is not to be considered a part of this contract.
2. The utilities shown on the construction plan are schematic only and are not to be considered complete. The contractor shall be responsible for notifying all utility companies prior to construction so that all utilities can be located in the field. The contractor shall locate existing utilities a minimum of two (2) weeks in advance of the construction operations in the vicinity of the utilities. Any damage incurred by the contractor shall be repaired immediately at the contractor's expense See Section 4.09 of the General Specifications.
3. All materials and workmanship employed under this contract shall conform with the "GENERAL SPECIFICATIONS FOR INSTALLATION OF AND EQUIPMENT FOR TRAFFIC SIGNALS FOR HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS" dated October 7, 1974; revised February 18, 1976.
4. All disturbed areas shall be properly restored in accordance with Section 4.20 of the General Specifications.
5. The reconstruction of the center median island and the removal of the temporary bituminous concrete curb island shall not be considered a part of this contract

CONTROLLER AND ACCESSORIES

1. NEMA three phase modular thumbwheel programmable contr. .er with solid state circuitry and digital timing, equivalent to the Crouse Hinds DM-400 Series Digital Controller unit or approved equal. The controller shall be capable of expansion to four phase operation.
   a. Equipped with one (1) vehicular actuated module.
   b. Equipped with two (2) vehicular actuated modules with volume density controls.
   c. Vehicular actuated phase modules shall be capable of the following functions: Minimum Green, Passage Time, Yellow, All Red Clearance, Dual Maximum, Pedestrian Timing, Recall and Memory
   d. Vehicular actuated phase module with volume density controls shall be capable of the following functions: Minimum Green, Passage Time, Yellow, All Red Clearance, Dual Maximum, Pedestrian Timing, Seconds Per Actuation, Time to Reduce, Time Before Reduction, Minimum Gap, Recall and Memory.
   e. Four phase signal overlap capability.
2. Conflict Monitor and Solid State load switches.
3. Solid State flasher and switch accessible through police door panel.
4. Ground mounted traffic controller cabinet large enough to accommodate the above control equipment and detectors. The cabinet shall be furnished with a thermostatically controlled cabinet vent fan
5. Finish of the cabinet shall be all-weather bronze paint.
6. Install 3'x4'x5" concrete slab in front of the controller cabinet.
7. Meter box shall be installed in vandal proof enclosure provided by the contractor

UNDERGROUND WIRING

1. Underground wiring shall be placed in new PVC Conduits under the road surface and in grass areas, as shown on the Contract Drawings.
2. The conduit shall be sized to accommodate future wiring for pedestrian (WALK/DON'T WALK) signal heads, and pedestrian push button detectors
3. The contractor shall furnish an "as-built" drawing as per "General Specifications - 4.02b"

LOOPS AND DETECTORS

1. The following new loops shall be installed:

Number	Dimensions	Phase
1	6'x 40'*	A
2	6'x 25'	B
3	6'x 18'	B
4,5	6'x 18'	C

* Loops to be installed with 6'x3' powerhead detection of small vehicles.

2. Loop 1 shall be wired to a standard detector.
3. Loops 2 and 3 shall be wired in parallel to a standard detector.
4. Loops 4 and 5 shall be wired in parallel to a standard detector.
5. All wiring shall be in accordance with manufacturer's recommendations for correct operation.
6. Loop 1 shall operate in presence mode. Loops 2, 3, 4 and 5 shall operate in pulse mode.
7. Standard detectors shall be Sarasota 2158/MS or approved equal.

SIGNAL HEADS

1. The contractor shall provide the following new signal heads:

Signal Number	Description
1	Optically programmed 3-section signal head with green left turn arrow; "3M Model 131" or approved equal
2,3,4,5,6,7,8,9	12" diameter indications

2. All signals shall have brown baked enamel finish and shall be vertically mounted with clevis hangers. Signal No. 1 shall be bracket mounted to the signal pole.

POLES

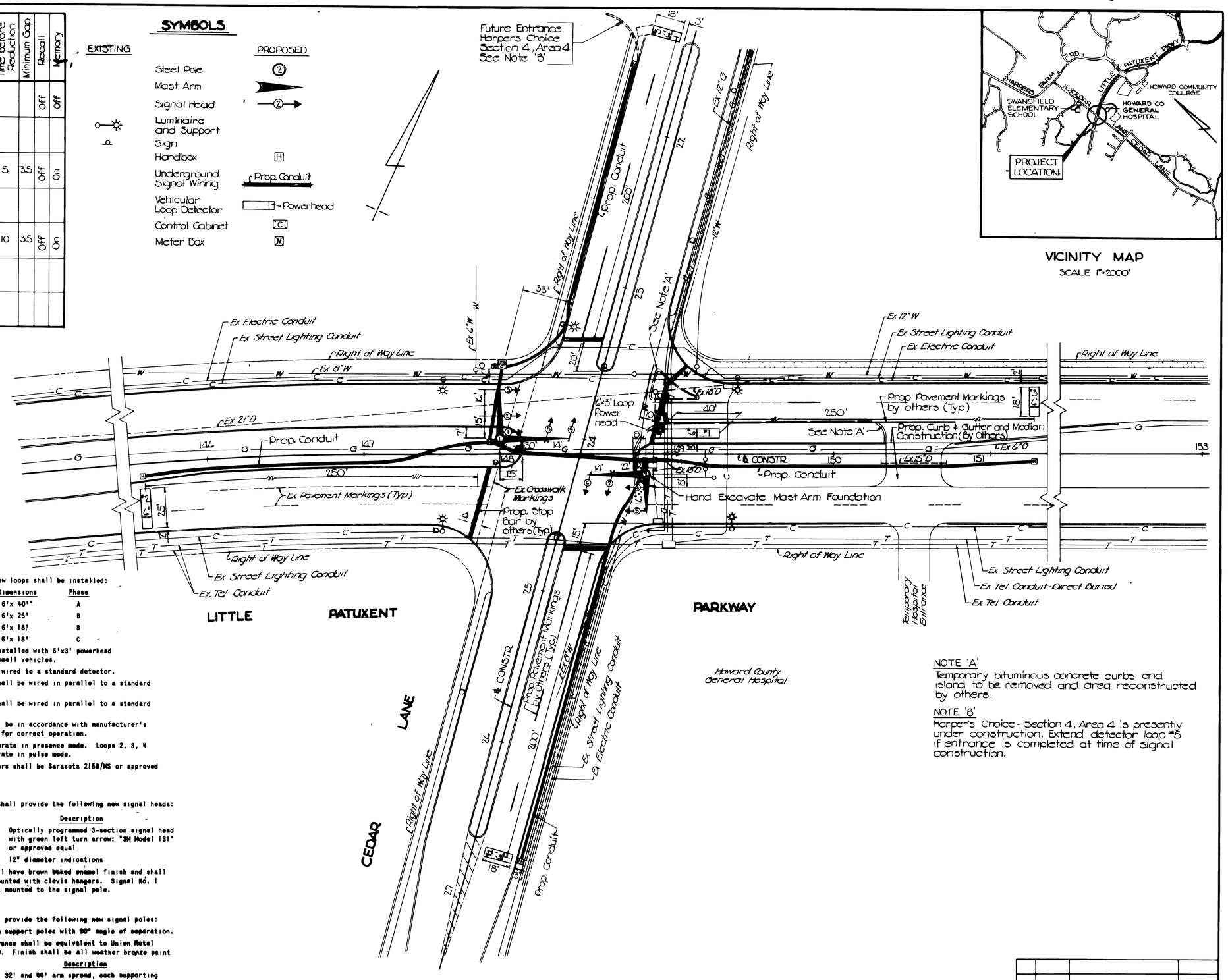
The contractor shall provide the following new signal poles:

1. Two (2) twin arm support poles with 90° angle of separation.
2. Style and appearance shall be equivalent to Union Metal Design No. 50700. Finish shall be all weather bronze paint
3.

Pole Number	Description
1	32' and 44' arm spread, each supporting two signal heads.
2	26' and 38' arm spread, each supporting two signal heads.

SYMBOLS

	EXISTING	PROPOSED
Steel Pole		②
Mast Arm		
Signal Head		②
Luminaire and Support		
Sign		
Handbox		H
Underground Signal Wiring		Prop. Conduit
Vehicular Loop Detector		Powerhead
Control Cabinet		CC
Meter Box		M



VICINITY MAP
SCALE 1"=2000'

NOTE 'A'
Temporary bituminous concrete curbs and island to be removed and area reconstructed by others.

NOTE 'B'
Harper's Choice - Section 4, Area 4 is presently under construction. Extend detector loop #5 if entrance is completed at time of signal construction.

NO	DATE	DESCRIPTION OF REVISION	SIGNATURE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11-19-80
CHIEF - BUREAU OF ENGINEERING — DATE 11-19-80
CHIEF - DIVISION OF ROADS, BRIDGES AND STORM DRAINAGE — DATE 11/18/80
CHIEF - TRAFFIC DIVISION — DATE 11-18-80

PREPARED BY
THE WILSON T BALLARD CO
CONSULTING ENGINEERS
OWINGS MILLS, MARYLAND
TEL NO 363-0150

STATE OF MARYLAND — DANIEL J. CLARY — No. 15661 — REGISTERED PROFESSIONAL ENGINEER
Daniel J. Clary 9-10-80

PLAN
CONSTRUCTION OF TRAFFIC SIGNAL AND EQUIPMENT LIST

LITTLE PATUXENT PARKWAY / CEDAR LANE
CAPITAL PROJECT NO. T-0-7011
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DRAWING NO 1 OF 1
SCALE 1"=30'
D.T.C. DESIGNED BY
R.W.S. DRAFTED BY
K.L.E. CHECKED BY

#740

CEDALPP 5